

UTILITY PATENT APPLICATION

TITLE OF INVENTION
DIRECT CURRENT SPLIT AIR CONDITIONING
SYSTEM FOR A VEHICLE

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BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to air conditioning systems, and in particular to a direct current split air conditioning system for a vehicle.

Background of the Invention

The present invention is a high efficiency air conditioning system operating solely from a direct current power source. One of the system's unique innovation is that its major components (condenser, compressor and evaporator) can be separated and placed remotely from each other allowing the components of the system to be fitted into confined spaces and in positions more advantageous to the cooling performance of the system without the constraints of a self-contained unit (single box design) or for the need of ducts to conduct cooling to an area.

This system is capable of producing nearly twice the BTU rating of cooling at the same current draw of any system available today. Additionally because the system's components are separated and require less support structure, it weighs less than half that of other similar systems and is able to be more integrated with a vehicle because of its reduced bulk.

Efficient and effective direct current air conditioning systems for small battery powered vehicles have been developed in the past; but their shortcomings have been in their poor overall cooling

1 ability for the amount of power consumed and their bulky size and added weight with one-box
2 enclosures and added support structure.

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4 The instant air conditioning system may be installed in a wide variety of vehicles. For example,
5 the compressor and condenser may be mounted in a small box behind the seat, and the evaporator
6 may be mounted in a compartment in the vehicle roof, although a other installation options are
7 depicted in the following specification and drawings, and are considered to be within the scope of
8 this invention.

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10 The split installation of component taught in the instant disclosure allows:

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12 1. The system to be installed without any alteration the basic vehicle design, and/or

13
14 2. The evaporator placement to be high up in the occupant area using reverse convective
15 forces (cold air falling) to improve the cooling effect of the system.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a direct current split air conditioning system for a vehicle which may be installed on a vehicle or other installation site in harmony with the design of the vehicle or other installation site. Design features allowing this object to be accomplished include an evaporator, condenser and compressor which may be mounted remotely relative to each other. Advantages associated with the accomplishment of this object include increased flexibility of installation, and more complete integration with the vehicle or site design.

It is another object of the present invention to provide a direct current split air conditioning system for a vehicle which may be installed on a vehicle or other installation site in a manner which maximizes cooling efficiency. Design features allowing this object to be accomplished include components, including the evaporator, which are mounted remotely from each other. Benefits associated with the accomplishment of this object include improved cooling effect to be attained by the position of the evaporator, and the associated cost and energy savings.

It is still another object of this invention to provide a direct current split air conditioning system for a vehicle whose weight is less than that of conventional, equivalently powered systems. Design features enabling the accomplishment of this object include remotely mounted components. Advantages associated with the realization of this object include reduced system weight, reduced support structure required, and hence reduced power drain on a vehicle upon which the direct current air split conditioning system for a vehicle is mounted.

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2 It is yet another object of this invention to provide a direct current split air conditioning system
3 for a vehicle which is competitive in cost. Design features allowing this object to be achieved
4 include the use of components made of readily available materials, and commercially available off-
5 the-shelf materials. Benefits associated with reaching this objective include reduced cost, and
6 hence increased availability.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with the other objects, features, aspects and advantages thereof will be more clearly understood from the following in conjunction with the accompanying drawings.

Two sheets of drawings are provided. Sheet one contains figures 1 and 2. Sheet two contains figures 3 and 4.

Figure 1 is a side view of a vehicle having a compressor and a condenser mounted on its vehicle rear shelf, and an evaporator mounted to its vehicle roof.

Figure 2 is a side view of a vehicle, and depicts alternate compressor mounting locations.

Figure 3 is a side view of a vehicle, and depicts alternate condenser mounting locations.

Figure 4 is a side view of vehicle, and depicts alternate evaporator mounting locations.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 is a side view of vehicle 2 having compressor 20 and condenser 22 mounted on its vehicle rear shelf 14, and evaporator 24 mounted to its vehicle roof 12. Vehicle 2 additionally comprises vehicle body front 4, vehicle body bottom 6, vehicle body rear 8, and vehicle roof support shelf 10.

One of the principal advances inherent in the instant direct current split air conditioning system is, as its name implies, the ability to mount the separate air conditioner components (that is, compressor 20, condenser 22 and evaporator 24) remote from each other. This permits the use of the design of the vehicle to which the air conditioning system is to be mounted to maximum advantage.

Figures 2 – 4 depict different locations where the different components may be mounted. Although the specific vehicle depicted in figures 2 – 4 is a conventional golf cart, it is intended to fall within the scope of this disclosure that the instant direct current split air conditioning system may be mounted to any vehicle.

An additional advantage inherent in the instant invention is the use of direct current to power the direct current split air conditioning system. The use of direct current minimizes power losses, thus enhancing system efficiency. In the preferred embodiment, the instant direct current split air conditioning system could be designed to run on 12, 24, 36 or 48 volts direct current, or any other appropriate direct current voltage.

Figure 2 is a side view of vehicle 2, and depicts possible alternate compressor 20 mounting locations. As may be observed in figure 2, compressor 20 may be mounted to vehicle body front 4, vehicle body bottom 6, or vehicle body rear 8. For illustrative purposes, figure 2 depicts condenser 22 mounted to vehicle rear shelf 14, and evaporator 24 mounted to vehicle roof 12.

Figure 3 is a side view of vehicle 2, and depicts possible alternate condenser 22 mounting locations. As may be observed in figure 3, condenser 22 may be mounted to vehicle body front 4, vehicle body rear shelf 14, or vehicle body roof 12. For illustrative purposes, figure 3 depicts compressor 20 mounted to vehicle body bottom 6, and evaporator 24 mounted to vehicle body front 4.

Figure 4 is a side view of vehicle 2, and depicts possible alternate evaporator 24 mounting locations. As may be observed in figure 4, evaporator 24 may be mounted to vehicle body front 4, vehicle roof support 10, or any location on vehicle roof 12. For illustrative purposes, figure 2 depicts compressor 20 mounted to vehicle body bottom 6, and condenser 22 mounted to vehicle rear shelf 14.

The ability to mount evaporator 24 in a variety of locations affords the opportunity to make maximum use of the tendency for cold cooling air emanating from evaporator 24 to flow downwards onto the occupants of vehicle 2, thus maximizing the efficiency of the instant direct current split air conditioning system.

1 It is contemplated to fall within the scope of this disclosure that compressor 20, condenser 22 and
2 evaporator 24 be mounted at any appropriate location, whether on or off a vehicle, where direct
3 current would be available, and air conditioning required.

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5 While a preferred embodiment of the invention has been illustrated herein, it is to be understood
6 that changes and variations may be made by those skilled in the art without departing from the
7 spirit of the appending claims.

DRAWING ITEM INDEX

1		
2		
3	2	vehicle
4	4	vehicle body front
5	6	vehicle body bottom
6	8	vehicle body rear
7	10	vehicle roof support shelf
8	12	vehicle roof
9	14	vehicle rear shelf
10	20	compressor
11	22	condenser
12	24	evaporator